



Initial Review
BOX AF

PATENT # 11/
Docket No.: 45751USA8B

P. Spruell
11-30-95

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

JOSEPH P. KRONZER et al.

Serial No.: 08/154,989

Filed: November 18, 1993

For: FIBROUS FILTRATION
FACE MASK

) **BOX AF**

) Group Art Unit: 3307

) Examiner: Aaron J. Lewis

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*Request
Recons.*

RESPONSE

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the Office Action mailed September 12, 1995, applicants submit the following remarks.

Claims 25-34 stand rejected under 35 U.S.C. § as being unpatentable over U.S. Patent 4,807,619 to Dyrud et al. (Dyrud) and U.S. Patent 4,363,682 to Thiebault.

Applicants urge the Examiner to withdraw this rejection because neither Dyrud nor Thiebault teach or suggest a nonwoven fibrous layer that contains thermally bonding fibers (including bicomponent fibers) where the fibrous layer is molded in a cup-shaped configuration and has a surface fuzz value of not less than 7.5 after being subjected to a surface fuzz abrasion test. Although Dyrud discloses a molded nonwoven fibrous layer that has the composition of applicants nonwoven fibrous layer, nowhere does Dyrud teach or suggest how to provide such a molded fibrous layer with a surface fuzz value of not less than 7.5. Although Thiebault teaches how to reduce surface fuzz, *it does not contain any suggestion or motivation for applying its teachings to Dyrud's fibrous layer that contains bicomponent fibers.*

In Thiebault, filtering layer 1 is superficially treated to reduce surface fuzz. This filtering layer 1 corresponds to Dyrud's filtration layer 16. *Dyrud's filtration layer 16 does not contain bicomponent fibers.* As taught in the paragraph that bridges columns 6 and 7, Dyrud's filtration layer 16 comprises melt-blown microfibers that have an average diameter of less than 10 micrometers. These fibers preferably are electrically charged like the fibers 2 in Thiebault's filtering layer 1 (see Thiebault at column 2, lines 32-40).

In the Office Action, the Examiner indicated that applicants' claims do not "appear to require that the fibers of the filtration layer become bonded together during the molding operation." This is correct because applicants are not claiming such a product. As indicated above, applicants mold a fibrous layer that contains bicomponent fibers into a cup-shaped configuration. This type of molded layer is commonly referred to in the art as a "shaping layer" (see, for example, Dyrud's Abstract). Filtration layers -- such as layer 1 in Thiebault and layer 16 in Dyrud -- are not molded into cup-shaped configurations. *These layers contain electrically-charged, melt-blown microfibers and are not molded into cup-shaped configurations because their ability to filter particulates would be seriously compromised.*

Contrary to what was said in the Office Action, there is nothing irrelevant about the lack of correspondence between the layer that Thiebault subjects to surface treatment (i.e., filtering layer 1) and the layer that Dyrud molds into a cup-shaped configuration (i.e., layers 15 and 17 in Dyrud). *The lack of correspondence between these layers is the main reason why applicants' invention is patentable over these documents.* There is no motivation in the art for a person of ordinary skill to apply Thiebault's surface treatment (of Thiebault's filtering layer) to Dyrud's shaping layer.

Applicants do not use the term "shaping layer" in their claims because it is a rather fuzzy term (no pun intended). Instead, applicants choose to define their shaping layer using language that better satisfies the terms of 35 U.S.C. § 112, second paragraph. As recited in applicants' claims, the nonwoven fibrous layer that maintains low surface fuzz is molded into a cup-shaped configuration, and it contains at least about 40 weight percent thermally bonding fibers where at least 10 weight percent of the fibers are bicomponent fibers. A product of this structure is recognized by persons skilled in the art as a "shaping layer".

It must be recognized that applicants' invention provides a number of advantages that are neither taught nor suggested by Thiebault and Dyrud. Applicants reduce the surface fuzz for two reasons: (1) to prevent the fuzz from irritating the wearer's face by chaffing; and (2) to prevent fibers in the molded nonwoven web from shedding and being inhaled by the wearer or falling into an open wound. Although the Examiner correctly asserts that Thiebault also reduces surface fuzz to provide improved comfort, the comfort that Thiebault refers to is not the same comfort that applicants' invention achieves. Thiebault's comfort stems from an alleged reduction in pressure drop -- not from preventing dangling fibers tickling the wearer's face. Thiebault alleges that its surface-treated filtering layer 1 can eliminate the need for a porous covering 5 (shown in Figure 1) and thereby reduce pressure drop (referred to as "depression" in Thiebault) so that exhaled air can be more easily displaced from the inside the mask. Thiebault cannot provide the comfort that applicants' invention provides because Thiebault's filtration layer 1 does not contact the wearer's face. Applicants' molded cup-shaped layer, however, (which corresponds to numeral 4 in Thiebault) does contact a wearer's face (see applicants' specification at page 8 and Figure 2; applicants' molded layer 17 corresponds to Thiebault's porous shell 4).

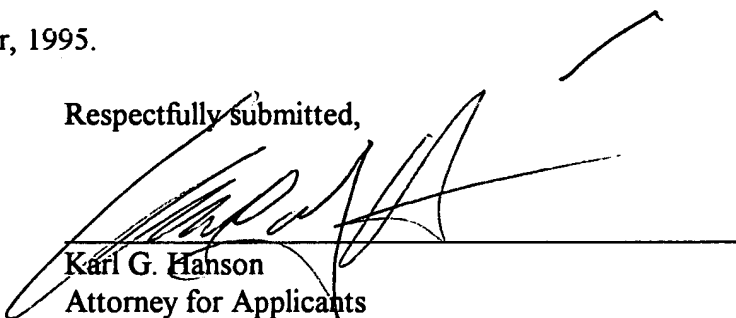
In short, the prior art would not have motivated a person of ordinary skill to surface treat Dyrud's shaping layer (15 and 17) using the method disclosed in Thiebault. Thiebault reduces surface fuzz in a filtration layer to eliminate the need for a porous covering -- and Dyrud's filtration layer does not contain bicomponent fibers: it contains electrically-charged microfibers, and these fibers would not be molded into a cup-shaped configuration.

In regard to the Section 112 rejection, applicants urge the Examiner to withdraw this rejection for the reasons presented in applicants' Response filed June 27, 1995. It is not proper to reject applicants' claims just because subjective human evaluation is required. Essentially all empirical data requires some degree of subjective human judgment.

In light of the above, please favorably reconsider the rejections and allow this application at an early date.

Dated this 10th day of November, 1995.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231, on the date noted below.



Karl G. Hanson

Dated: November 10, 1995